HUMAN ARRIVAL AND ITS DISPERSAL IN SULAWESI DURING THE HOLOCENE

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A. Introduction

The several glacial periods that happened at the high and middle latitude areas during the Pleistocene, have caused varied changes of sea levels in all over the world, including in the Indonesian archipelago which is located in the equator. During those periods, when most of the ocean water froze due to a drastic drop of temperature, regressions occurred, sometimes the sea level dropped up to 100 meters. According to Molengraaff and Weber (1921), regression of ocean water during the Würm glacial period reached 72 meters. Meanwhile, de Terra's calculation showed a sea level drop of about 120 meters during the Mindel glacial period, which was the most intensive ocean regression during the Pleistocene (de Terra, 1943)

Thus during the so-called glacial periods, the sea-level was a 100 meters lower than today. Such variations had formed --on oceans less than 100 meters deep-- land bridges, which made possible the migrations of mammals, including human, on the Sunda Shelf (from Southeast Asia to Sumatra, Java, and Kalimantan) and the Sahul Shelf (Papua and Australia). On the other hand, the existence of deep oceans between Kalimantan and Sulawesi, and between Sulawesi and Maluku placed Sulawesi in a unique position : it was part of a specific migration route from North China, Taiwan, and the Philippines through Sangihe land bridge. The Wallace line in the west of Sulawesi and the Weber line in the east --both spread from the north and south up to the Philippines-- mark the very specific status of Sulawesi regarded from the point of view of its faunal dispersal. It is almost certain that for Sulawesi, the migration processes during the glacial periods are

more determined and influenced by north – south movements rather than west-east ones.

Therefore, the end of the last glacial period at around 11,800 years ago was a special phenomenon in the Indonesian archipelago. The layout of the islands was permanently configured as its actual condition. Since the beginning of the Holocene, Sulawesi has become an independent island, and the human occupation processes in this island, both the north–south and west-east routes, can only occur through the sea. The very specific position of Sulawesi during the glacial and interglacial periods gives special nuance to its human occupation process. Sulawesi was part of a particular migration route since the Holocene, with very distinct characteristics than those occurred in the Sunda Shelf in the west and the Sahul Shelf in the east.

B. Human Remains in Sulawesi during the Holocene

Although there are plenty of caves that are identified as habitation places from early Holocene, data on human remains in Sulawesi are negligible. The hard work of the naturalists from Swiss, the Sarasin brothers –Paul and Fritz– at the caves of Sulawesi in 1902–1903 did not yield remains of the bearers of the Toalan culture. P.V van Stein Callenfels, who investigated since 1933, accompanied by H.D. Noone and A.A. Cense, also experienced similar situation (Stein Callenfels, 1938). Even though Callenfels did find various important cultural items at Leang Tomatua Kucicang (Cave of the Lonesome Old Man), not a single report was published. Likewise is the excavation at Leang Sebang in the same area (Heekeren, 1972). It was not until H.R. Van Heekeren conducted research in South Sulawesi that some human remains were found. From Uleleba Cave at the central part of South Sulawesi were found artifacts and fragmented human remains from two individuals. The remains consist of 12 cranial fragments, a fragment of an upper right maxilla with two premolars, 5 isolated molars, 4 milk

teeth belonged to a child, and 1 incisor of old and young individuals. There was also an almost intact humerus, indicating a race of small stature (Heekeren, 1972).

A robust mandible –but the teeth were missing– was also found at Karassa Cave (Ghost Cave), in the karst of east of Maros, near the village of Patanuang AsuE. This site is presumed to be one of the oldest sites of the Toala culture from the post-glacial period (Heekeren, 1941). From Leang Cadang --near the course of the Wallanae River—in the north of South Sulawesi near Soppeng, W.J.A. Willems and F.D. McCarthy found human remains, consisted of mandible, maxilla, more than 2,700 isolated teeth, and some long bones. They related to the upper Toala culture, characterized by arrowheads, mollusk scrapers, and potteries, dated back to 4,000 years ago (Heekeren, 1941). Most of the teeth, especially the incisors and canines (>85% in upper incisors and >32% in lower canines) show clear shovel shapes, a strong characteristic of the Mongoloid race (Jacob, 1967). Based on the dimensions, those teeth are comparable to the teeth from Bola Batu at the southeast of Leang Cadang.

The Bola Batu site, which is located in the karst hills of Bone, yielded a short but heavy mandible with some molars and some cranial fragments. In this case, Leang Cadang and Bola Batu are two sites in Sulawesi that were inhabited by the Mongoloid race around 4,000 years ago. Based on their teeth, which are smaller than similar finds at Liang Toge (Flores) and bigger than those from Gilimanuk (Bali) –two sites from the palaeometalic period-- it is assumed that the inhabitants of Leang Cadang lived after the Liang Toge period and before the Gilimanuk period. Other human remain from occupational cave was found at Lampoa Cave to the east of Maros, excavated by C.H.J. Franssen in 1948. The find --associated with the Toala Culture-- is a human skull. From Ara Cave, which is located at the farthest southeastern tip of Sulawesi, facing the Selayar Island, Cense found a small but strong mandible and a number of molars in 1933. The finds were associated with stone arrowheads, bone spatula, and pottery concentration near the surface. Heekeren (1937) assumed that the finds from Ara

Cave were from the latest phase of the Toala culture. The only neolithic site in Sulawesi that yields human remains is the site of Kalumpang, which is located at the bank of the Karama River. The finds consist of an incisor, 4 fragments of ulna bones, a fibula, and some metatarsals.

Those human remains found at a number of caves in Sulawesi which bear the characteristics of the Toala culture –consist of fragments of skulls, mandibles, some other long bones, and even human skeletons-- never show traces of burial activities (Heekeren, 1972). This probably indicates that the inhabitants of those caves --with the context of Toala culture-- never bury their dead in the caves. Perhaps they buried the dead outside the caves or exposed them in trees, after which the bones were distributed among their families and relatives, a ritual that can still be found among the Negritos of the Andaman Islands and among some Melanesian and Australian tribes.

Aside from the very few human remains compared to the many explored caves, information obtained from them is also very limited. Not one of them was identified, both the characteristics and the race. This situation is far different from those of human remains of the kitchen midden sites in North Sumatra, or some caves in the northern and southern parts of East Java at that time, or even the recent finds from the caves of Southern Mountains in Yogyakarta and East Java (Widianto, 2002), which were generally dominated by the Australomelanesoid race. It is because van Stein Callenfels –or even van Heekeren-- were probably not accompanied by physical anthropologist like Mijsberg, during their prehistoric researches in Sulawesi in the first half of 20th century. Due to this situation, it seems that more researches on the human remains from South Sulawesi are really needed, which at least will reveal identification up to their sub-species, like what have been reported from other parts of Indonesia.

On the other hand, elements of jar burials were also found in Central Sulawesi and Selayar. The artifacts that were commonly functioned as burial gifts in jar

burials –such as neolithic goods, pottery, and metal objects– show that the jar burials were from the Neolithic up to the Palaeometalic periods. Similar burials were also found near the megalithic complex of Bada, Central Sulawesi, but whether or not those burials were part of the megalithic culture is still unknown. At Sa'bang, about 50 km north of Paloppo, 10 jar burials were discovered associated with pottery, bark cloth beater, grinding stones, and iron arrowheads. It is assumed that those were secondary burials. There is no further explanation about the human remains in those sites, so that the bearer of the culture has not been able to be clearly identified.

C. The Arrival and Its Dispersal

Although there are many prehistoric habitation caves in Sulawesi, especially in South Sulawesi within the context of the Toala culture, there are hardly human remains from this island, particularly since a complete human skeleton has never been found. The condition of the finds, which are mostly fragmented, made it difficult to determine clearly their racial characteristics. The skull components, which are the main components in race determination, were only found in fragments. Therefore, the identity is only vaguely mentioned, like an individual with "small stature" or with "small teeth". More apparent condition is seen in the more than 2,700 teeth found at the Leang Cadang Cave, based on investigation by T. Jacob (1967), are known to be the remains of Mongoloid race. Similarly, the mandible from the site of Bola Batu was also grouped into the same race, as also the two individuals from the Uleleba Cave.

More complex racial issue is shown by two other mandibles from Karassa and Ara caves. Both are short and small, but with strong postures. The cultural association and stratigraphical position of those two mandibles are very different. The mandible from Karassa Cave is from the oldest Toala horizon, while the one from Ara Cave is related to the youngest Toala culture. In this context, Stein Callenfels assumed that the absolute date of the youngest Toala culture –based on

the glass bracelet from Leang Tomatua Kucicang that was found among scrapers, arrowheads, bone spatula, and bark cloth beater– is 300 to 100 BC (Stein Callenfels, 1938). If this assumption is correct, then the mandible from Ara Cave can be correlated with the Neolithic culture from about 2,300 years ago, which was commonly developed by the Mongoloid race. On the other hand, the connotation of "the oldest Toala culture" for the short and heavy mandible from Karassa Cave does not give any implication, which can clearly distinguish it from the Mongoloid characteristics.

With regard to the human remains from open sites in Sulawesi, although also very fragmented, their racial status are more easily positioned than the cave-dwellers because they were related to younger culture. Artifacts and burial customs from the jar burials in Central Sulawesi and Selayar Island –which show the characteristic of the palaeometallic culture from early AD about 2,000 years ago, and similar to those from Gilimanuk and Plawangan sites– almost positively belonged to the burial culture of the Mongoloid race. According to Jacob (1967), the human remains of Kalumpang show Melanesian characteristics. But this statement is debatable since the Kalumpang site is a real Neolithic site (Simanjuntak, 1995), while the human remains from this site is in a very poor condition and fragmented. Therefore, as also the case with the cave-dwellers in context with the Toala culture, the Mongoloid race was the main bearer of cultures in Sulawesi. This race inhabited the caves and developed the Toala culture --which was very dominant in South Sulawesi-- when they first arrived in the island at least at 4,000 BP. Their burials were later found in Central Sulawesi and Selayar.

Even though human remains in this island can be traced back since the Pleistocene based on the palaeolithic tools like those found on the gorge of the Wallanae River, their physical evidences point to a very recent period. No human remains were found until now in Pleistocene or palaeolithic contexts. The bearer of the chopper–chopping tool culture on the Wallanae gorge is still very

problematic, both because of the uncertain dates and the fact that no human remains have been found. As a consequence, based on their remains, the human's existence in Sulawesi was very recent, the oldest ones were from the prehistoric cave habitation sites dated back to the end of the first half of the Holocene period, up to the jar burial sites from 2,000 BP.

Based on what could be identified from the very limited and fragmented human remains, the Mongoloid race had dominated the appearance and development of cultures in this island, probably since early Holocene. The Australomelanesoid race, which were generally occupied the habitation caves in early Holocene, such as those dominantly found at Gunung Sewu (Widianto, 2002), did not show their clear traces in Sulawesi. Evidences reveal that this last mentioned race which commonly developed the culture characterized by flakes, scraper and bone tool technologies in the Sunda Shelf since early Holocene, were almost unidentified in Sulawesi. In this island, the culture was mainly dominated by the mix of flakes, scraper, double pointed bone tools, and arrowheads. This is the typical characteristics of the Toala culture, and developed by the Mongoloid since the beginning. To fulfill their spiritual need, they developed the culture of cave paintings --left hand prints with red background-- discovered for the first time by C.H.M. Heeren-Palm in the interior of Leang PattaE Cave. At Leang DjariE Cave near Saripan Cave, C.H.J. Franssen also found the similar paintings. Other painting motif, like the ones found at Leang Burung Cave, is a local pig, *Sus celebensis*, which can still be found nowadays. Furthermore, cave paintings were also seen in other areas in Maros and Pangkep, for instance at Sumpang Bita Cave (Eriawati, 1997).

Some data on human remains in Sulawesi prove that the people with Mongoloid characteristics did not immediately occupy open areas when they first arrived in the island. They were identified as the cave-dwellers, before they finally came out into the open places. This Mongoloid people are assumed to come in Sulawesi since at least 4,000 years ago. They originated from and being part of the

migration of the Austronesian-speaking people from the north, Taiwan, and dispersed rapidly southward to the Philippines and Sulawesi, before they finally reached the Pacific around 2,000 years ago (Bellwood, 1997). This migration route of the Austronesian-speaking people is called the “Out of Taiwan” theory. They left their homeland somewhere in South China, around Fujian or Zhejiang, before they arrived in Taiwan in 6,000 BP. Because of the rapidity of those migrants in reaching the Polynesia, only about 4,000 years, the “Out of Taiwan” theory is also known as the “Express Train to Polynesia”. The human remains from Leang Cadang, Bola Batu, and Uleleba caves are included in this migration route, which then moved eastward through the northern islands of East Indonesia to Micronesia, and further onward.

In biological perspective, the existence of the Austronesian-speaking people, known as the Mongolid race, in their dispersal in islands of Southeast Asia – including Indonesia- is named the Southern Mongoloids. They have a physical and blood characteristics, and other characteristics, which form a unique characteristic complex (Jacob, 1967). Human skeletal data from different sites show that the genetic flow of the Mongoloids never reached Papua and other nearby islands in the eastern part of Indonesia. In the east, human remains are dominated by the characteristics of Australoids–Melanesians–and the extinct Tasmanid that belong to the Arafurid sub-race (Jacob, 2002). On the other hand, the Southern Mongolids that were developed in islands Southeast Asia are different from the Northern Mongolids, which were developed in China, Korea, and Japan. During investigations on human remains in Southeast Asia and the Pacific, Howells identified similarities of the specimens from Polynesia and Micronesia with the phenotype characteristics of the Southern Mongoloids, and he assumed that the inhabitants of those two areas in the Pacific are the descendants of the Southern Mongolids (Howells, 1973). They were not the descendants of the Northern Mongolids, not even related to the Australoid, Melanesians, or Papua New Guinea people that also lived in that area. If this assumption is correct, then there is a great possibility that the Southern Mongoloid migrants had indeed

evicted the Australomelanesoid people that were once inhabited the area. In term of the successive life-spans of both races in Indonesia, the population change occurred at around 5,000-4,000 BP. It is assumed that “replacement theory” model in general had happened to the Australomelanesoid and Mongoloid races, in which the latter replaced the Australomelanesiod, but not in Sulawesi. No clear Australomelanesoid traces in this island. The “replacement” process can also be seen among human remains found at a number of prehistoric habitation caves since the end of Pleistocene period.

D. Conclusion

By studying the human occupation mechanism in the second half of the Holocene until the end of the prehistoric period in Indonesia, it seems that the Mongoloid race --or more specifically known as the Southern Mongoloid-- has fully dominated the entire Indonesian archipelago, except Papua and the islands in the eastern part of Indonesia which are more dominated by the Papua-Melanesians people. Various data on human remains with Mongoloid characteristics at different types of prehistoric habitations –prehistoric caves and jar burials– have given very important description about the mobility of the Mongoloid race since their first arrival in the archipelago. Generally speaking, the Mongoloid replaced the Australonelanesoids at around 5,000 BP, but the last mentioned race was not totally extinct, for their features still can be found within the human remains of Anjer, West Java, some 2,000 years ago. For Sulawesi in particular, it seems that the Australomelanesoid characteristics, which were very dominant in the Sunda Shelf during the first half of the Holocene, left no traces in this island. The Mongoloids are very dominant, they were the only people lived in Sulawesi during the Holocene. The specific geographic landscape of Sulawesi –which was bordered by the Wallace and Weber lines, and its close-related to the Philippines and Taiwan during the Glacial Period– has separated the island from the migration processes occurred in the Sunda and Sahul Shelf at the end of the Pleistocene and along the Holocene. The human remains in Sulawesi that were dominated by the

Mongoloid race, are the evidence of their role in the migration process of the Austronesian-speaking people within the context of the “Out of Taiwan” theory. In this case, Sulawesi was part of the main route of the migration theory, and was more influenced by the migration mechanism from north to south rather than the east–west movement.

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